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**NOTES ON NORTH AMERICAN MUTILLIDÆ, WITH  
DESCRIPTIONS OF NEW SPECIES.**

BY AXEL LEONARD MELANDER.

The following notes and descriptions are the result of a study of several collections of North American Mutillidæ. The paper grew from a review of the local forms of Central Texas to its present proportions as the study of the various collections revealed interesting notes. A full list of the species is given in order to supply data for distribution, as in many cases the species were taken from unrecorded localities. Whenever the species was taken in a new State a \* has been prefixed to its name. In order to corroborate the identity of the species the larger part of the material has been compared with the excellent type-collection of the American Entomological Society at the Philadelphia Academy of Natural Sciences. By this means the variable species have been assigned their places, and the element of doubt in identifying from descriptions alone the species of so large and difficult a group has been eliminated. Inasmuch as the recent paper by Mr. Wm. J. Fox in these TRANSACTIONS for 1899 gives the best arrangement of our species, that paper will be followed, the species listed in the same order, and the notes given may be regarded as supplementary to his revision. Nevertheless, the present writer does not agree in all cases with his scheme of phyletic relationship; *e. g.*, the association of *harmonia* with *waco*, and the divisions *anthophoræ* and *imperialis* are not based on phyletic reasoning, and hence are artificial categories; but in the main the paper is carefully prepared and is of great service to the student. The great variability of certain of the species, and the confusing resemblance of others distantly related have combined to make species definition a hard task, necessitating more lengthy descriptions than Mr. Fox is accustomed to give. Especially in the *Photopsis* group is this to be marked. The abandonment of *Photopsis* by Fox and Dalla Torre is as much an extreme as the erection by others of genera on single characters of certain of these pale-colored and night flying species. It may be remarked that individuals of at least one species, *danaus*, are assignable, some to *Photopsis*, others to *Odontophotopsis*.

Until some experience is gained, the assignment of species to the various groups given by Mr. Fox will often be confusing. Owing to the strenuous way in which the females use their mandibles, the teeth are frequently worn down or quite wanting in old specimens. In these cases care should be noted before a final decision is given that the specimen is a new species in an incongruous group. The differences given on page 221 of Mr. Fox's paper for separating the groups *imperialis* and *anthophoræ* are inversely stated, and should read thus:

- First abdominal segment (♀) smaller than second, more or less nodose; in ♂ the first and second segments are not similarly sculptured, the first coarser than the second.....Gr. *imperialis*.  
 First and second segments (♀) sessile; first segment ♂ not more coarsely sculptured than second.....Gr. *anthophoræ*.

Pygidial structure is sometimes variable within a species, and hence, although generally a good character, cannot be regarded as infallible. In *similima*, for example, the striæ are not uniform, tending to diverge at the tip. *Hippodamia* seems to represent the extreme where the striæ have become transverse, and since as yet no intermediate gradations have been discovered, this form can be given specific rank. The structure of the petiole of the abdomen, the vestiture and sculpture of the body, in fact every single character that can be chosen is subject to greater or less variation. An interesting character which appears to have been unnoticed heretofore is the peculiar plumose structure of the hairs covering the body of certain of the *Photopsis* males. This is often especially noticeable on the abdominal fringes, and recalls the vestiture of the Bees.

In conclusion, I wish to thank the following individuals and institutions who have generously loaned their collections for unlimited study: Rev. G. Birkman, of Fedor, Texas; Mr. Samuel Henshaw, for the Museum of Comparative Zoology, Cambridge, Mass.; Mr. Theo. D. A. Cockerell, for unworked material of his own and belonging to the New Mexico Agricultural College, Mesilla; Mr. C. F. Baker, for the Chicago Academy of Sciences; Dr. O. S. Westcott, of Chicago; and my collaborator, Mr. C. T. Brues, of New York. The types of most of the new species are located in the collections of these gentlemen as indicated at the end of each description.

## MUTILLINÆ.

Genus **MUTILLA** Linnæus.Group *grandiceps*.1. **Mutilla grandiceps** Blake (1).\*

The male and female of this species were found running over a sandy and pebbly slope at Austin, Texas. The ground was occupied by a colony of *Halictus pruinosus* Robertson, which would suggest that this species is possibly parasitic on the bee.

Several specimens, Austin and Fedor, Texas. The upper side of the abdomen varies in color from reddish to black. This species resembles quite closely the ant *Pogonomyrmex* both in color and movements, and not *Atta*, as Mr. Fox states.

Group *canadensis*.2. **Mutilla nephele** Fox (3).

Several females from Fedor, Texas, October (Birkman).

3. **Mutilla canadensis** Blake (4).

This is apparently the commonest species of *Mutilla* on this continent, as the collection contains more specimens of this than of any other form. We have examined over one hundred specimens from Massachusetts (July–September), Virginia, and Central Texas (April–June). The occurrence of this species with the same bee with which *grandiceps* associates has been noted in the "Biological Bulletin," June 1903, p. 4.

Specimens from the south are somewhat smaller and of a purer yellow than those from the east. Examples of an almost piceous color are not rare in the Massachusetts series.

4. **Mutilla scævolella** Ckll. and Casad. (5).

One female, Luna, New Mexico (Cockerell).

5. \* **Mutilla contumax** Cresson (7).

A single specimen of this ornate species was secured at Austin, Texas, April 28, 1901. This individual differs from the Coloradan type in that the longer hairs of the metathorax, petiole and legs are glistening white instead of ochraceous. The ground color of the second segment is dark rufous, overlaid with black pubescence, while the pubescence of the   |  |  -shaped mark is whitish.

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\* The parenthetical numbers following the species refer to Mr. Fox's arrangement.

6. **Mutilla donæ-anæ** Ckll. and Fox (9).

One female, Mesilla Park, New Mexico (Cockerell).

7. **Mutilla Wickhami** Ckll. and Casad. (10).

One female, Fedor, Texas (Birkman).

Group *simillima*.

8. **Mutilla montivaga** Cresson (15).

Plate IV, fig. 2; petiole of *brazoria*.

Occurring at Austin and Fedor, Texas, in the variations *montivaga* to *brazoria*. April to October.

9. **Mutilla hippodamia** Fox (16).

Plate IV, fig. 42; pygidium.

One specimen, in a lot of *simillima* collected by the Rev. G. Birkman at Fedor, Texas, apparently belongs to this species. While otherwise closely resembling the variable *simillima*, it is aberrant in the widely diverging striæ of the pygidium and in the rounded sides of the metathorax.

Of the type specimens of this species one has the antennæ red instead of blackish. The pygidium is transversely rugose, and not longitudinally so, as stated in the key (see fig. 42).

10. **Mutilla simillima** Smith (17).

Plate IV, fig. 1; petiole.

Mass., Penna., Va., Ky., Ill., Tex. (M. C. Z., etc.).

The specimens in the Philadelphia Academy of Natural Sciences determined as this species have no black on the venter nor on the second dorsal segment. No hairs arise from the punctures of the abdomen. Specimens from Texas (Fedor, Birkman) are more or less black caudally and ventrally and have very sparse erect abdominal hairs. The species *ætis*, *hippodamia*, and *simillima* can be quickly separated by the sculpture of the pygidium. In *ætis* the striæ diverge widely, in typical *simillima* they are closely placed and more strictly longitudinal, the only divergence being at the very tip of the median ones; in *hippodamia* the striæ are rugose, straight and transverse. The Massachusetts specimens are considerably smaller as a lot and have the lighter spots of the second abdominal segment round. They are variable in the definiteness of the pygidial sculpture, the striæ of which sometimes are quite

faint. In the Texas specimens the lighter markings of the second segment are larger and quadrate.

One individual from Austin, Texas, exhibits but a single tooth at the middle of the mandibles; and this in view of its similar habitus, would lead one to search for it among the species of the group *anthophoræ*. The lengthened pedicle and first flagellar joints, the carinæ of the lower occiput, the crenulate sides to the metathorax, the strigose metapleuræ, and the sharp, uniform ventral keel, however, are all characters distinctive enough of *simillima* to show the relationship of the Austin specimen to that species.

11. **Mutilla propinqua** Cress. (19).

Nebraska, Texas (M. C. Z.), Mesilla Valley, New Mexico (Cockerell).

12. \* **Mutilla oceola** Blake (20).

Several males were taken at Wood's Hole, Mass., during August of last summer, by Mr. Brues. They may possibly be the male of *harmonia* Fox, but they seem to belong to this species. The punctuation of the second abdominal segment is uniform and rather close, the size of the insect is larger and the wings appear to be shorter than in *oceola*.

13. **Mutilla Sanbornii** Blake (21).

The Museum of Comparative Zoology at Cambridge contains a specimen of this species without locality label.

Group *waco*.

14. **Mutilla waco** Blake (25).

Plate IV, fig. 3; petiole.

Not rare. Austin and Fedor, Texas.

15. \* **Mutilla harmonia** Fox (26).

Plate IV, fig. 4; petiole.

This species closely resembles *M. cypris* in color. It measures twelve mm. in length. Several specimens were taken at Woods Hole, Mass., during different seasons. Not rare on the sand dunes at Porter, Indiana. The species is not related to *waco*.

Group *asopus*.16. **Mutilla bexar** Blake (29).

Five specimens, Fedor, Texas, possibly belong to this species. The dorsal groove of the metathorax is filled with reticulations, and the second ventral is simple. Otherwise they agree with the description.

Group *occidentalis*.17. \* **Mutilla gloriosa** Saussure (30).

Plate IV, figs. 5 and 45.

Buckeye, Arizona, one female.

The pygidium is granular in this species.

18. \* **Mutilla pseudopappus** Cockerell (31.)

Plate IV, figs. 6 (petiole), and 44 (pygidium).

A single specimen, taken in the Trans-Pecos Region of Western Texas, and another from Mesilla Park, New Mexico.

The pygidium has distinct undulating longitudinal striæ.

19. **Mutilla magna** Cresson 32).

Plate IV, fig. 7; petiole.

Arizona (Westcott); Sinoloa, Mexico (Cockerell).

20. **Mutilla Sackenii** Cresson (33).

Plate IV, fig. 8; petiole of female (*erudita*).

California, Arizona (Westcott).

21. \* **Mutilla occidentalis** Linnaeus (34).

Plate IV, fig. 9; petiole.

Florida, Mississippi, Arkansas, Tennessee (Westcott); New Jersey, Maryland, West Virginia, Georgia, Florida, Texas, Nebraska (M. C. Z.)

22. **Mutilla comanche** Blake (35).

Plate IV, fig. 10; petiole.

Buena Vista, Colorado (Wickham); Florida (M. C. Z.).

Rev. Mr. Birkman has taken examples both of the typical form and of the variety *clotho* Blake at Fedor, Texas.

23. **Mutilla oreus** Cresson (36).

Plate IV, fig. 11; petiole.

Fedor, Austin, Cuero, and Laredo, Texas; Mesilla, Organ Mountains, Las Cruces, Albuquerque, Socona, New Mexico.

Not rare, both males and females occurring commonly.

*Leda* Blake is not distinct from this form.

24. \* **Mutilla creusa** Cresson (37).Plate IV, fig. 12; petiole of *medea*.

Two specimens of the variety *medea* Cress. were taken at Fedor, Texas, May (Birkman), one with the cephalic hairs black, the other bright orange above.

Arizona (Westcott); Las Cruces, Las Vegas, Mesilla Park, White Mountains (6300 feet), New Mexico (Cockerell).

One of Mr. Cockerell's specimens was found in combat with *Microbembex monodonta*. In view of the similar struggles between the bee *Halictus* and *Mutilla canadensis*, which we have observed, it may be surmised that this species (var. *medea*) is a parasite of the Bembecid.

25. **Mutilla ægina** Cresson (39).

Plate IV, fig. 13; petiole.

Rather common, ranging in size from nine to eighteen mm.

Fedor, Austin, Columbus, Texas. (May to September.) New Mexico (M. C. Z.).

26. **Mutilla quadriguttata** Say (42).Plate IV, fig. 14; petiole of *electra*.

Not rare, occurring as the typical form and the variety *electra* Blake, at Fedor, Austin and Cuero, Texas. (May to October.)

Although inconstant as to color, this species has produced no variety as aberrant as a specimen from Fedor. In this individual the thorax is over one-half longer than usual, not constricted above the middle legs nor rounded posteriorly, but is broadly ovate, with the sides subparallel. Otherwise the sculpture and color agree perfectly with typical *quadriguttata*.

27. **Mutilla ferrugata** Fabr. (43 and 66).*Mutilla ferrugata* Fabr. ♀.*Mutilla fenestrata* Lep. ♂.*Mutilla Lepeletierii* Fox.

Plate IV, fig. 15; petiole of female.

Both the males and females are very common.

Woods Hole, Mass.; Colebrook, Conn.; New Hampshire; Maryland; Pennsylvania; Illinois; Nebraska; Kansas; Austin, Texas; Arizona.

It is quite doubtful if *castor* Blake, *macra* Cresson, and *agenor* Fox are valid species. If they are not forms of *ferrugata* the struc-



ture of the petiole of the abdomen is not a character of sufficient importance upon which to base their separation. Even in the collection of the American Entomological Society the species are much confused.

28. **Mutilla vesta** Cresson (44).

Another common species. Woods Hole, Mass., and Austin and Fedor, Texas. April to October.

The color of the erect hairs of the head and of the strongly spined legs varies from red to black. Most of the Eastern specimens differ from the typical *vesta*, although the typical form is found with them also. The following variations seem to be fairly constant, and may be tabulated :

*VESTA*.—Striæ of pygidium suddenly interrupted apically, the tip smooth and subshining; ventral keel of the first abdominal segment twice toothed, as represented by the figure, and gradually sloping off in front. Texas, Massachusetts. (Fig. 16.)

*Var. a*.—Striæ of pygidium more or less interrupted, the apical portion opaque and granular; ventral keel of same type, but not angular. Massachusetts.

*Var. b*.—Striæ of pygidium entire; carina of first ventral segment strong, truncate anteriorly, as in figure 17. Massachusetts.

These three variations can be distinguished from the next variety by the rounded spots of the second dorsal segment, the structure of the petiole, and the finer irregular striæ of the pygidium, which number about fourteen and are confused with numerous shorter striæ.

*Var. c*.—Striæ of pygidium straight, entire, deep and coarse, numbering not over twelve, without short striæ in the interspaces; ventral keel shaped as in the figure. The lighter spots of the second dorsal segment are confluent. Five specimens, Woods Hole, Mass. Because of its close similarity to the other forms of this exceedingly variable species in form, sculpture and color, it is thought best not to give this insect specific rank. (Fig. 18; petiole.)

29. \* **Mutilla canella** Blake (46 and 75).

*Mutilla canella* Blake ♂.

*Mutilla rugulosa* Fox ♀.

We have one female specimen from Woods Hole, Mass., August, which appears to belong here. The male is not rare at Fedor, Texas. May-June.

30. \* **Mutilla cypris** Blake (47).

Plate IV, fig. 19; petiole.

Numerous specimens from Woods Hole and New Bedford, Mass., and from Chicago, Illinois.

31. **Mutilla infensa** Melander and Brues.*M. infensa* Mel. and Br., Biol. Bull., 1903, June, p. 24.

Plate IV, fig. 20; petiole.

Head transverse, broadly concave behind, finely and closely punctate, mandibles short, edentate; thorax elongate, sub truncate in front, narrowed behind, rugoso reticulate, the ridges of the meshes of the metathorax not raised except where they meet, scutellar scale prominent; abdomen nearly impunctate, pygidium nearly smooth; legs strongly spined. Ferruginous, legs and apex of the abdomen black, second dorsal with two ovate paler spots, pubescence short, sparse, stiff, dense and black on thorax and base and apex of second segment, elsewhere pale yellow.

Woods Hole, Mass. Found running about on the nests of *Halictus*.

This species differs from *canella* Blake by the broader head, petiolate abdomen and smooth pygidium. From *cariniceps* Fox it is distinct by its partially black pubescence, impunctate second dorsal, and by the pygidial structure.

32. **Mutilla texana** Blake (52).

Plate IV, fig. 22; petiole.

Austin and Waco, Texas, September and October.

33. **Mutilla chlamydata** sp. nov.

*Female.* Head, thorax, and basal half of the abdomen rufo-piceous, apical half of abdomen and legs piceous black; rugoso-punctate; largely clothed with appressed golden-red pubescence and with stubby erect hairs. Head confluent rugosely punctured, not produced behind the eyes, but rather truncate posteriorly, cheeks with deep, rather distinct punctures which bear comparatively short hairs, clypeus truncate, fringed with brown setæ; scape thick, bent on outer third, provided with deep coarse punctures, its yellow hairs sparse, first flagellar joint but little longer than the second; mandibles short, triangular, blackened; palpi piceous; front and vertex with dense, appressed, golden-red pubescence, and with short, erect, concolorous hairs. Thorax egg-shaped, almost rectangularly rounded to the posterior face of the metathorax, closely and coarsely punctured on the sides, the sculpture above concealed by the dense mat of appressed golden-red pubescence, among which arise the sparse, stubby, golden hairs, the hind face of the metathorax less coarsely punctured; pleuræ, coxæ and femora

with straggling, whitish, longer hairs. Disc of the first segment of the abdomen impunctate dorsally, margined however by setigerous punctures; ventrally the first segment has close, deep punctures, anterior half of the keel obliquely prominent, deeply excised at its middle; seen from above, the petiole is trapezoidal, the anterior angles but little produced, subacute, posteriorly subsessile with the second segment; from the side this incisure is not pronounced; second abdominal segment with subconfluent punctures, its anterior and posterior margins and a median vague line piceous, anteriorly with appressed black pubescence and long, stiff, black hairs, the posterior margin likewise clothed, but the erect hairs are brown and short, elsewhere covered with appressed pubescence and short, stubby hairs concolorous with the vestiture of the thorax but less dense; ground color of remaining segments blackish, the pubescence of the third dorsal black, of the others whitish; the suberect hairs of the venter, tibiae and tarsi whitish; pygidium formed as in *texana*, with reflexed margin, truncate tip, and longitudinally striate disc, the striae, however, deep and entire, reaching the entire length of the pygidium.

Length, 9 mm.

Plate IV, fig. 21; petiole.

Several specimens, central Illinois, collected near the town of Bath, on the Illinois River, August, 1899.

While this species would lead to the group (species 42-50) defined by Mr. Fox as having the second segment of the abdomen subsessile with the petiole, and the head comparatively small, yet its general habitus is much more suggestive of *texana* Blake. However, it is quite distinct from that species in the structure of the keel of the first ventral segment, the longer striae of the pygidium, the shorter third joint to the antennae, and the denser pubescence of different color. In *texana* the carina ends posteriorly in a distinct tubercle, while the anterior blade is entire; the striae of the pygidium are weak and abbreviated; and the first flagellar joint is one-half again longer than the second, while the metathorax is less abruptly declivous.

34. **Mutilla obscura** Blake (53 and 70).

*Mutilla obscura* Blake. ♂.

*Mutilla scævola* Blake. ♀.

Plate IV, fig. 26; petiole of male.

The Rev. Mr. Birkman has fortunately been able to associate these two species as sexes of the one form. Both males and females are not rare at Fedor and Austin, Texas. April to June.

Another male was obtained by Dr. Wm. M. Wheeler at Bull Lake, Wyoming. The Museum of Comparative Zoology has both the female and the male from Massachusetts.

35. **Mutilla pœcilonota** sp. nov.

*Female.* Ferruginous. Head subquadrate, but slightly wider than the thorax, the hind angles rounded, the sculpture of the upper surface concealed beneath the dense covering of golden-yellow matted hairs, the erect hairs of the head and thorax short and sparse, yellow, punctures of cheeks strong, clypeal margin lightly crenulate; antennæ pale ferruginous, scape more slender but sculptured and clothed as in *obscura*, i. e., with uniform, sparse, short hairs and rather coarse punctures; mandibles slender, acute, uniformly bent, black apically, palpi rufopiceous. Thorax broad and truncate in front, due to the expanded dentate humeri, sides of mesothorax parallel, metathorax narrowed, truncate posteriorly; seen from the side, the dorsum presents a convex outline, dorsum coarsely punctured, becoming reticulate posterior to the metathoracic spiracles, the disc of the metathorax, however, smooth and impunctate, sculpture above largely concealed beneath the matted golden-yellow pubescence, pleuræ impunctate except above the middle coxæ. Disc of petiole of abdomen smooth, margins with deep punctures, petiole nodose, strongly constricted from the second segment, apically with a patch of silvery pubescence, its anterior angles dentiform, the ventral keel not deep, convex, entire; disc of second segment with deep subconfluent punctures, those of the under surface more separated and rounded, remaining segments with smaller and denser punctures; the disc of the second segment marked beyond the middle with two rounded patches of sparse whitish appressed hairs, elsewhere with blackish pubescence, the lateral and ventral margins of the second, third, and fourth segments, and the mid-dorsum of the third, fourth, and fifth segments fringed with denser silvery pubescence, hairs of apex of abdomen black; pygidium closely granular. Spines of the legs black, less prominent than in the female of *obscura*.

Length, 8 mm.

Plate IV, fig. 23; petiole.

Described from a single female specimen collected in the Trans-Pecos region of western Texas.

Although agreeing in general with *obscura*, this species is markedly and specifically distinct by the dense vestiture of the head and thorax. The dentiform humeri are also characteristic.

36. **Mutilla Bollii** Fox (55).

Plate IV, fig. 24; petiole.

Not rare. Fedor and Austin, Texas. May to October.

37. \* **Mutilla coccineohirta** Blake (56).

One male, Las Cruces, New Mexico (Cockerell).

38. **Mutilla ochracea** Blake (59).

We have seen a male of this species from Nevada.

39. \* **Mutilla bioculata** Cresson (60).

Several specimens of this species were taken at Bath, Illinois, by Mr. Brues and myself, during August, 1899. Texas (M. C. Z.)

40. **Mutilla zelaya** Blake (64).

Plate IV, fig. 25; petiole.

Males and females of this were taken at Fedor and at Austin, Texas, April to September.

41. **Mutilla castor** Blake (65).

We have this from Texas (Fedor and Cuero) and from Illinois (Chicago).

42. **Mutilla agenor** Fox (67).

Three males from almost the type locality differ in the finer punctuation of the body. McHenry, Ill., August.

43. \* **Mutilla macra** Cresson (68).

Fedor, Texas, May (Birkman); Kentucky (*hispidula*, M. C. Z.); Texas, Massachusetts (*macra*, M. C. Z.). Notice the remarks concerning the last three species under *ferrugata*, No. 27.

44. **Mutilla creon** Blake (72).

Two specimens, Fedor, Texas (Birkman).

45. **Mutilla gibbosa** Say (76).

There is in the Museum of Comparative Zoology a specimen indefinitely labelled Pennsylvania.

46. **Mutilla Foxii** Cockerell (80 and 89a).

*Mutilla Foxii* Cockerell. ♂.

*Mutilla heterochroa* Ckll. and Casad. ♀.

Plate IV, fig. 28; petiole of ♂: fig. 29; petiole of female.

Not rare, occurring in both sexes at Mesilla, New Mexico (Cockerell).

47. **Mutilla californica** Radoszkowski (86).

Plate IV, fig. 27; petiole.

Colorado (Westcott); Mojave Desert, California (Cockerell).

48. **Mutilla pacifica** Cresson (87).

San Diego, California (H. Hemphill, collection of M. C. Z.).

49. **Mutilla aureola** Cresson (88).

California (collection of M. C. Z.).

50. **Mutilla gorgon** Blake (89).

This is not a rare species, occurring at Fedor, Texas (Birkman).

The so-called variety *tisiphone* Blake is strangely constant in presenting the "rubbed appearance." We have it from Fedor, Texas, and from New Mexico. See fig. 30; petiole of abdomen from side.

51. \* **Mutilla fulvohirta** Cresson (89b).

Plate IV, fig. 31; petiole. ♂.

Fedor, Texas (Birkman); Colorado (Westcott); Mesilla and Santa Fé, New Mexico (Cockerell); Washington (M. C. Z.). The head is often black and the second abdominal segment may bear orange spots.

Group *pennsylvanica*.

52. \* **Mutilla scæva** Blake (90).

Recorded from Massachusetts, in the Museum of Comparative Zoology.

53. **Mutilla Henshawi** sp. nov.

Wholly black, with black and whitish pubescence; mandibles robust bidentate; eyes rounded, faceted, ocelli minute; marginal cell of the blackish wings bluntly pointed.

*Male.* Uniformly black over all. Head transverse, somewhat wider than the thorax, somewhat produced behind the eyes and obtusely rounded to the nearly straight hind edge, contiguously and rather deeply punctured; clypeus short, broadly emarginate at the middle; eyes prominent, more or less irregularly rounded, anterior ocellus minute, posterior ones rudimentary, represented by two smooth plane areas; antennæ reaching to the middle legs, the scape slightly more than one-half the distance between the eyes, gradually bent at its outer third, closely minutely but deeply punctured and clothed with erect and decumbent black hairs, basal joints of the flagellum, including the pedicel, equal in length, square in outline; hairs of the head erect, blackish, on each side of the vertex, at base of mandibles, and on the occiput whitish. Prothorax with small, deep, dense punctures, those of the mesonotum slightly less closely placed, scutellum finely rugoso-punctured, pleuræ sculptured like the mesonotum, metathorax reticulate, marked with a median line abbreviated in front and behind; the vestiture of the thorax consists of short erect hairs, whitish along the sutures, the tegulæ and the base of the wings, sparse on the metathorax, and blackish elsewhere. Petiole of abdomen somewhat triangular in outline, the front angles dentiform, sessile with the second segment; seen from the side, it is not nodose and scarcely constricted from the second segment, rather closely punctured like the second segment, but the punctures well separated, ventral carina reduced to a small bisetigerous tubercle; remaining segments more finely and densely punctured, ventral segments sculptured like the dorsals, pygidium finely margined, finely rugose. The sparse and erect hairs of the abdomen are dirty white except on the last three dorsal segments, where they are black. Femoral hairs sparse, whitish, tibiæ and tarsi more densely covered with decumbent whitish pubescence, the spines of the hind tibiæ and tarsi reduced setiform. Wings uni-

formly fuliginous except that the second submarginal ends in a subhyaline spot. This continues basally just within the second submarginal as a subhyaline streak, crossing the center of the first submarginal and ending at the base of the stigma. Veins and stigma black, marginal cell longer than the first submarginal, bluntly acuminate, second submarginal shorter than the first, strongly narrowed toward the marginal, receiving the recurrent nervure at the middle. In one specimen the pentagonal third submarginal and the third discoidal are vaguely defined, in the other wholly wanting.

Length, 7.25-10.5 mm.

Two males. Forest Hill, Mass., August 31, 1898 (Samuel Henshaw), and Woods Hole, Mass., August, 1900.

*Henshawi* is placed with the species of the group *pennsylvanica* because of its rudimental eyes and the neuration of the wing. It is quite different, however, from the other males of the division in the form of the first abdominal segment, which is quite sessile with the second, as in the females. If this character be considered of more importance than the other, the species would be placed in the Western group *anthophoræ* with the species *adonis* Fox, or *thamyra* Fox. From these slender species the new form is obviously far removed.

54. **Mutilla pennsylvanica** Lepeletier (91).

Four specimens from Fedor, Texas (Birkman). May-October.

55. **Mutilla auripilis** Blake (92).

Not rare in Central Texas, occurring at Fedor and Austin.

56. **Mutilla jason** Fox (93).

One specimen taken by the writer at Austin, Texas.

57. **Mutilla balteola** Blake (94).

Plate IV, fig. 32; petiole.

Not rare at Fedor and Austin, Texas. One specimen differs in the reduced white fasciæ of the abdomen; that of the second segment bears no median projection anteriorly.

Group *imperialis*.

The species of this group and of the next are closely related, forming the old genus *Photopsis* of Blake as far as the males are concerned. Were it not for the numerous species here included, it would be well not to attempt to subdivide this group, at least not on the grounds taken. The division into genera, such as *Odontophotopsis*, is equally untenable, as the sexual character chosen from one sex is subject to great variation. For this reason the species

we have seen are grouped together, but some relationship at least is expressed in the following key for the separation of the males. The descriptions of the new species have been interpolated as near to their relatives as is practicable. The number of undescribed forms occurring in the Southwestern States is remarkable. The males are caught mostly at lights which they seek in their nocturnal flights. The females, however, are much more seclusive, and have to be sought for on the hot, arid sand during the day-time.

Mesosternum with a pair of strong projections near its anterior border.

(Subgen. **Odontophotopsis** Viereck) 2.

Mesosternum with a pair of crenulate longitudinal ridges, but with no strong tooth anteriorly.....11.

Mesosternum completely unarmed.....(**Photopsis** Blake) 14.

2. The projection of the mesosternum acutely pointed, more or less beak-like and longitudinally placed, though sometimes small; wings hyaline..3.

The projections at most truncate pyramidal, but not pointed, rather transverse; wings with brown clouds.....10.

3. Petiole of abdomen rather nodose, constricted apically, and with stronger punctures than those of the second segment.....4.

Petiole nearly sessile with the second segment, not nodose and nearly impunctate; abdominal segments fringed with plumose hairs.....8.

4. Petiole twice as long as broad, with fine punctures on the disc; all the abdominal segments fringed with strongly plumose white hairs.

**Westcottii** sp. n.

Petiole shorter and with coarser punctures.....5.

5. Mesonotum with fine scattered punctures.....6.

Mesonotum with close deep punctures, the grooves abbreviated on the anterior half; veins thin, testaceous, wings hyaline.....7.

6. Parapsidal grooves extending nearly the whole length of the notum; veins strong brown, wings tinged with brown.....**pudica** sp. n.

Grooves wanting; wings hyaline, veins testaceous.....**grata** sp. n.

7. All the abdominal segments fringed with plumose hairs; legs and antennæ testaceous; hind ocelli nearer the eyes than each other.

**Erebus** sp. n.

Only the second abdominal segment with a fringe of plumose hairs, the remaining vestiture dense and long, however; ocelli nearer each other than the eyes; antennæ and part of femora fuscous.

**melicausa** Blake.

8. Abdomen with setigerous punctures, fuscous apically; femora blackened at tip.....**concolor** Cress.

Hairs of abdomen not arising from punctures; smaller species with pale legs.....9.

9. Mesothorax with strong punctures and complete grooves; metathorax reticulated over all above.....**hamata** sp. n.

Mesothorax with shallow punctures and abbreviated grooves; metathorax with elongate basal areas.....**trita** sp. n.



Austin, Texas (May 5, 1900); Mesilla (at light, August 28th),

Las Cruces (September 6th), La Cueva, Organ Mountains (Altitude 5300 ft., at light, September 4th), New Mexico (Cockerell). Another specimen from the Chicago Academy of Science labelled Texas.

60. \* **Mutilla bellerophon** Fox (100).

Fig. 59; wing.

Numerous specimens, Austin and Fedor, Texas. The punctuation of the head and abdomen is variable but correlated,—the head punctures are rather fine in some specimens and close in others. When the head is finely punctured the second abdominal segment is smooth, otherwise it is punctulate with scattered punctures. Some specimens have the abdomen rufous. Several distinctive characters of the Texas specimens are obvious and may be noticed: the bisected area of the metathorax is as long as three areoles; the outer cubital vein is attenuated before and behind, while the inner cubital is evanescent posteriorly; the marginal cell is clouded toward the stigma; and the mesosternum has two crenulate ridges.

61. **Mutilla Cockerelli** sp. nov.

Head, thorax and petiole of abdomen reddish, remainder of abdomen, legs and antennæ black, wings infumated, veins black, coarsely punctured species; mesosternum with small teeth.

*Male.* Head rounded, broadly so behind the eyes, moderately punctured, clothed with erect, whitish, scattered hairs; ocelli relatively small, the distance between the hind ones three times the diameter of an ocellus and greater than the distance to the eyes; the shallow space in front of the anterior ocellus connected with the posterior edge of the clypeus by a narrow impressed line arising in a deep puncture in front of the ocellus; antennæ wholly black, shorter than the head and thorax, the scape densely punctured and with short, very sparse pubescence. Thorax shining, prothorax confluent punctured, mesothoracic punctures separated, deep, the grooves linear and black, middle ones complete; scutellum rugosely punctured; metanotum reticulate, but not coarsely, basal areas confusedly crenulate transversely, mesopleural punctures strong only in the centre of the bulbous portion; mesosternum with two arcuate and obliquely diverging lines of transverse denticles. Petiole of abdomen nodose, constricted behind, the front angles sharp, strongly and confluent rugoso-punctate, its black hind margin with a scattered white fringe; second abdominal segment strongly punctured, more closely so in front and laterally, its hind margin with a conspicuous white fringe of simple and plumose hairs; remainder of abdomen punctulate, and with a similar white fringe; venter punctured and fringed like the dorsum. Coxæ piceous, legs black, tibial spurs fuscous, hairs silvery white. Wings lightly infumated, stigma black, veins blackish, pubescence black, third submarginal obscure.

Length 10.5 mm.

Fig. 55; mesosternum.

Described from a single male specimen from the collection of Prof. T. D. A. Cockerell, collected by Mr. C. A. Townsend, at Cuero, West Texas, June.

This species resembles *bellerophon* Fox, differing by the shorter and darker antennæ, smaller ocelli, and darker wings. The armature of the mesosternum is also quite different.

62. **Mutilla mesillensis** Cockerell (101).

Las Cruces and Arago, New Mexico (Cockerell).

63. **Mutilla grata** sp. nov.

Small, testaceo-rufous, apex of abdomen fuscous, sparsely hairy, head globose, almost impunctate, antennæ longer than head and thorax, mesonotum smooth and shining, metanotum coarsely reticulate, mesosternum with two minute teeth, petiole short, strongly punctured and constricted from the smooth and polished second segment, legs testaceous, wings hyaline, veins pale, two submarginals, the second small.

*Male.* Testaceo-rufous, vertex blackened, apex of abdomen infuscated, head uniformly rounded and much produced behind the eyes, obsoletely punctulate, its pubescence very sparse, ocelli small, hind ones further from each other than from the eyes, a round, shallow, punctiform depression midway between the antennæ and the front ocellus; clypeus large, shallow, polished, with a prominent Y-shaped ridge in front of the antennæ; mandibles short, strongly bent, not very robust, the tips and the strong basal tooth blackened; antennæ testaceous, scape pale yellow, slender and nearly straight, almost glabrous, antennæ reaching to the base of abdomen. Prothorax shallowly and rugosely punctured, mesonotum smooth, polished, the grooves wanting or indicated posteriorly as a short punctured stria, scutellum finely rugulose, metanotum coarsely but rather shallowly reticulate, the basal areas small, slightly exceeding two areoles; mesopleuræ minutely reticulate towards the coxæ, mesosternum smooth except for the two minute, backward-pointing, acute teeth which are placed rather far back on the segment. Petiole of abdomen one-third longer than broad, and twice as broad at tip as at base, anterior angles dentiform, the hind margin strongly constricted from the second segment, strongly nodose and very coarsely punctured, beneath subcarinate in the middle, the carina terminating abruptly in front; second segment impunctate, polished, beneath very sparsely punctulate, third segment with a V-shaped speculum. Vestiture of thorax and abdomen very sparse, whitish, the second and third segments fringed with short, white, plumose hairs. Legs including the coxæ pale testaceous. Wings hyaline, stigma fuscous, veins yellowish, marginal cell short, second submarginal receiving the recurrent vein at its basal fourth, third submarginal completely wanting.

Length, 5.5 mm.

Fig. 58; wing.

Described from two male specimens collected by Mr. C. H. Townsend, at La Cueva, Organ Mountains, New Mexico, at an altitude of about 5300 feet, at light.

**64 *Mutilla pudica* sp. nov.**

Slender, pale ferruginous, cephalic punctures scattered, ocelli approximated, mesothorax distantly punctured, grooves distinct, metathorax with long, smooth basal space, pleuræ largely reticulate, first abdominal segment small, nodose, closely punctured, second almost impunctate, mesosternum with a pair of sharp, stout teeth; legs fusco-testaceous; wings yellowish, stigma black, third submarginal open.

*Male.* Pale ferruginous, apical segments fuscous, ocelli margined with black interiorly. Head round, its punctures fine and scattered, ocelli rather small, the front one distant from the others by about its length, hind ones closer to each other than to the eyes; mandibles toothed near the tip, the basal production large; clypeus broadly concave; antennæ pale fuscous apically, scape minutely punctured, sparsely short-hairy. Thorax elongate pyriform, slightly broader than head, distantly punctured, median grooves of mesonotum entire, lateral ones very shallow, abbreviated in front; scutellum rugoso-punctate; metathorax coarsely reticulate, basal area without median septum, extending two-thirds the length of the segment; mesopleuræ obsoletely punctured, mesosternum with a pair of strong beak-like projections in front. Abdomen petiolate, first segment small, longer than broad, nodose at tip, its punctures strong, confluent, ventral keel dentate anteriorly; second segment very sparsely and finely punctulate above and below, remaining segments impunctate, pygidium convex. Femora and tibiæ, except base, fuscous, remainder of legs testaceous. Wings hyaline, with faint yellow tinge, veins moderately strong, fuscous, stigma fuscous, third submarginal cell open apically. Vestiture sparse over all, pale yellowish white.

Length, 8.75 mm.

Fig. 53; mesosternum.

One male, collected by Mr. Samuel Henshaw at Pressy's Camp, Wenass Valley, Washington, July 7, 1882.

**65. *Mutilla Pattersonæ* sp. nov.**

Robust; testaceous, including antennæ and legs, process at base of mandibles strong, head with fine, distant punctures, rounded behind, mesonotum closely punctate, the middle grooves distinct, mesosternum without armament, metathorax coarsely reticulate, the bisected areas small, abdomen petiolate, the first segment closely punctured subnodose, remaining segments impunctate; vestiture long, pale yellow, wings hyaline, veins and stigma testaceous, two submarginals.

*Male.* Robust, rufotestaceous, clothed with rather long and moderately dense whitish pile. Head round, finely punctured, ocelli large, the front one distant from the hind ones by less than its width, space between hind ones greater than between them and the eyes; clypeus uniformly concave, truncate in front; mandibles stout, basal process very large; antennæ wholly testaceous, scape minutely punctulate, its pubescence very short; under side of head polished, impunctate. Thorax elongate pyriform, broader than head, prothorax reticulate, mesonotum closely and finely punctured in front, a little more sparsely behind, the grooves distinct, middle ones entire, side ones abbreviated on the front third; metathorax rounded, coarsely reticulate on the disc, basal areas short and broad, in length less than three reticulations; mesosternum irregularly punctured, medially impressed, unarmed; mesopleuræ finely reticulate, the impressed smooth area

narrow. Abdomen robust, strongly petiolate, first segment one-third longer than broad at apex, closely punctured, sharply constricted from the second segment, but subnodose, ventral punctures coarser, keel also punctured; remainder of abdomen impunctate, except that ventrally the second segment bears fine distant punctures. Legs testaceous, tibial spurs somewhat darker. Wings subhyaline, veins testaceous, stigma fuscous, third submarginal wanting; in the middle of the hind margin is a suffused brownish cloud.

Length, 15 mm.

One male, Fort Washington, Cal., October 3, 1895, collected by Miss Rose Patterson, in whose honor the species is respectfully dedicated.

66. \* **Mutilla albicincta** Fox (103).

Numerous specimens do not disagree with the description of this species except for individual differences, and may possibly be the same form, although they are from a different State, being taken at Arrego, near Talarosa, New Mexico, August 13, at light (Townsend collector, Cockerell). Some of the specimens show a minute denticle on the mesosternum, which may be the beginning of a pronounced armature of future generations.

67. **Mutilla Westcottii** sp. nov.

*Male.* Elongate, rufo-testaceous. Head produced and rounded behind the eyes, hind portion truncate when viewed from above, sparsely clothed with long white hairs, which arise from the scattered minute punctures, no other punctures present; ocelli rather large, hind ones closer together than to the eyes; a deep, narrow line arises midway between the base of the antennæ and the anterior ocellus, in a large, deep puncture, and continues forward to the antennæ; clypeus broadly and shallowly concave, truncate apically; antennæ testaceous, reaching back to the middle coxæ, scape with short fine hairs and punctures above; mandibles blackened at the obliquely tridentate tips, white-bristly along their base. Thorax elongate pyriform, prothorax coarsely rugosely punctured, mesonotum with scattered deep punctures, shining, the grooves abbreviated in front, the middle ones fuscous, tegulæ testaceous, impunctate, scutellum coarsely rugosely punctate, metanotum coarsely reticulate, the basal areas about equalling two of the other meshes, its hairs very sparse and short, but becoming plumose, white and long laterally; mesopleuræ nearly impunctate in front, becoming deeply pitted on the bulbous hinder portion; mesosternum with two sharp, beak-like teeth. Abdomen very slender, petiole gradually broadening to the thorax, where it is two times as broad as at the base, over two times as long as apical width, nearly impunctate above, the sides with obscure punctation; remainder of the abdomen impunctate. Vestiture of the abdomen consists of scattered fine white hairs and an apical fringe of broad and strongly plumose white hairs, which give a banded appearance to the abdomen. The usual U-shaped speculum present on the third segment. Legs testaceous, becoming fuscous beyond the middle of the four posterior femora, front tarsi and all tibial spurs fuscous, hairs dusky

white. Wings cinereo-hyaline, veins fine narrow, fusco-testaceous, stigma fuscous, third submarginal completely wanting, nervure entering the second submarginal just before the middle of its angulate under side.

Length, 13 mm.

Fig. 57; hair from abdominal fringe.

One male, collected near Albuquerque, New Mexico, by Dr. O. S. Westcott.

68. **Mutilla melicausa** Blake (105).

A single male, Austin, Texas, October, 1900.

69. **Mutilla hebes** sp. nov.

*Male.* Reddish; head subquadrate with distinct punctures, hind ocelli further from each other than from the eyes, mesonotal punctures strong, basal areas of metanotum long, mesosternum with two broad, blunt, transverse teeth, petiole of abdomen nodose though not constricted on the sides, strongly punctured, abdominal punctures sparse, two submarginals, a dusky cloud in the hind margin of the wing, legs fuscous.

Testaceo-rufous; moderately slender; head subquadrate, produced and broadly rounded, punctures rather strong, separated so that a line from the eyes to a hind ocellus passes through five punctures. This line is slightly shorter than the distance between the hind ocelli, ocelli rather small. There is no depression or groove above the antennæ, but the space in front of the ocellus is impunctate. A short clypeal ridge runs upward toward the antennæ. Proclinate and erect hairs of the head very sparse. Antennæ rufo-testaceous, as long as head and thorax. Prothorax with a rather strong, irregular, subconfluent punctuation; mesonotum with strong, close, rounded punctures, the grooves much shortened; scutellum closely rugosely punctured; metanotal reticulum rather fine, the basal areas narrow, equalling four of the meshes in length; mesopleuræ confluent punctured in front, mesosternum coarsely punctured, with two very prominent sub-transverse teeth near the front portion, the teeth transversely grooved so as to be bicuspid; vestiture of thorax and petiole long, sparse, erect, whitish, in front with deflexed hairs also. Petiole of the abdomen one-third longer than broad at tip, its sides nearly straight, subnodose apically and constricted at the very tip, deeply and coarsely punctured, the anterior angles acute, venter coarsely rugose, medially crenulate; second segment sparsely and finely punctured except on the sides in front where the punctures become stronger and closely aggregated, its pubescence sparse, partly short and caudally deflected and partly long and erect, apically closely punctulate and with a short fringe of white subserrate hairs, third segment with a conspicuous speculum and a broad punctulate apical margin, its pubescence sparse, erect, the apical fringe sparse, the hairs not evidently serrate, remaining segments similar, pygidium finely margined and aciculate; venter similar, the punctures of the second segment stronger and closer than above, no apical fringes. Legs testaceous, the femora and tibiæ fusco-testaceous apically, the hairs and spurs whitish. Wings subhyaline, veins narrow, dark brown, stigma black, third submarginal cell wanting, first cubital vein blackened on its costal two-thirds, thence whitish, a suffused brownish spot in the middle of the hind margin.

Length, 7.5-9 mm.

Fig. 47; occiput: Fig. 52; mesosternum.

Described from two males taken at light at Arrego, August 23d, and at Colorád, July 10th, New Mexico. Contributed by Professor Cockerell. Type in collection of the National Museum.

This species apparently comes near *orestes* and *melicausa*, but differs in the darkened legs, maculate wings and structure of the mesosternal teeth.

70. **Mutilla territa** Cockerell (106).

Three specimens, one of which is castaneous, from Colorado and Las Cruces, New Mexico. July and September. At light.

71. **Mutilla Erebus** sp. nov.

Rufotestaceous; head rounded, sparsely punctulate, prothorax confluent punctured, mesonotal punctures coarse, slightly separated, reticulum of metathorax large, mesosternum with two sharp teeth, petiole of abdomen deeply punctured, nodose apically and strongly constricted from the sparsely punctulate second segment, abdominal segments with a narrow fringe of plumose hairs, legs testaceous, wings hyaline, veins testaceous, third submarginal wanting.

*Male.* Rufotestaceous. Head but little produced behind the eyes, occipital angles not broadly rounded; sparsely and finely punctate; ocelli large, the hind ones one-third further from each other than their distance to the eye, no groove between the antennæ, but at the very base of the shallow clypeus is a short, sharp, truncate, transverse projection continued laterally and posteriorly as a fine carina, clypeus sparsely punctulate; mandibles strongly rounded, tip blackened, basal tooth moderate, their hairs short; antennæ concolorous with the body, scape testaceous, subconfluent punctured; the hairs of the head are sparse and white, consisting partly of long, serrate, erect ones and partly of short proclinate ones. Prothorax confluent punctured, mesonotal punctures stronger and deeper but separated, parapsidal grooves abbreviated on the front third, scutellum rugosely punctured, metanotum very coarsely reticulated, the basal areas small, equalling three normal spaces, mesopleuræ punctured, the punctures becoming areolated towards the coxæ; mesosternum armed with two strong, acute, downward-projecting teeth near their anterior portion. Petiole of abdomen one and two-thirds times as long as broad, the apical margin twice as broad as the basal, subcampanulate in outline but not suddenly narrowed in front, quite strongly nodose, the hind margin constricted, punctuation dense and deep along the sides but becoming more or less sparse on the dorsum; second segment sparsely punctulate above and below, remaining segments minutely punctulate, last dorsal finely aciculate, but not margined. Coxæ and legs testaceous over all, the spurs and spines concolorous, but the hairs whitish yellow. Wings hyaline, veins testaceous, stigma fusco-testaceous, second discoidal and third submarginal completely wanting, marginal, first submarginal and first discoidal cells slender, first submarginal receiving the recurrent vein just before the middle of the cell. Vestiture of thorax and abdomen sparse whitish, partly erect and partly delivous, the hairs presenting a serrate appearance, becoming plumose about the base of the wing, the metanotum and the abdominal incisures, so as to give a fasciate appearance to the abdomen.

Length, 11 mm.

Fig. 48; occiput: fig. 50; mesosternum.

One male, collected by T. D. A. Cockerell at Mesilla Park, New Mexico. Type in National Museum.

This species, according to Mr. Fox's tabulation, is related to *helicaon*, but is apparently distinct in the fine punctures of the head, the banded abdomen and the neuration of the wings.

72. \* **Mutilla nokomis** Blake (108).

The collection of the Museum of Comparative Zoology contains this species from Texas.

73. **Mutilla Birkmani** sp. nov.

*Female*. Wholly dark ferruginous. Head punctured; eyes rounded but distinctly faceted, very convex; mandibles subacute, with a slight inner notch; thorax rugose, pleurae moderately punctured; petiole of abdomen small, nodose; second segment with coarse, elongate punctures throughout; pygidium prominent, deeply striate longitudinally. Pubescence pale, moderately dense but not concealing the sculpture except on the metathorax; second segment of abdomen apically with a patch of black hairs.

Entirely dark ferruginous. Head subquadrate, straight behind, subequal to the thorax in breadth, closely finely punctured, more or less densely clothed with pale yellow, appressed, irregular pubescence above and with longer erect hairs on the vertex and base of the mandibles; eyes hemispherical, faceted; anterior edge of the clypeus convex, sinuous; scape curved at the middle, clothed above with short, coarse, glittering hairs, subequal in length to one-half the width of the front, pedicel oblong, first flagellar joint one-fourth longer than the second; mandibles stout, bent, bluntly attenuate on the straight outer three-fourths, tipped with black, palpi piceous. Thorax longer than wide, ovate, regularly narrowed behind, not constricted, the sides convex, rugoso-punctate, coarser behind, the disc with appressed black pubescence, elsewhere with appressed and erect whitish hairs, disc of metathorax with a dense patch of converging appressed pubescence, which is margined by erect hairs; pleurae densely and comparatively coarsely punctured. Petiole of abdomen when viewed from above nearly square, its anterior angles dentiform, rugosely punctured, the ventral keel emarginate before the middle; second segment densely and uniformly provided with elongate punctures, from which arise the yellowish appressed pubescence, its anterior and posterior margins provided with a median patch of black pubescence, that of the hind margin the denser, laterally and on the venter and the remaining segments the hairs become longer, whitish; apical segments with finer punctures; second ventral with coarse but distant punctures; pygidium margined and sulcate with close longitudinal striae. Legs fairly stout, clothed with long white hairs, the four posterior tibiae spinose.

Length, 4.5 mm.

Fig. 34; petiole.

Described from five specimens collected by the Rev. G. Birkman at Fedor, Lee County, Texas.

It is with pleasure that I am able to dedicate this insect to one



who has been an enthusiastic observer of the local fauna of Central Texas for many years.

The introductory characters in combination tersely indicate the systematic position of this species, which seems to lie between *halcyone* Fox and *myrrha* Fox, combining the characteristics of the two species.

Types in the collections of Mr. Birkman and of the writer.

74. **Mutilla nanula** Dalla Torre (124).

Occurs rarely at Austin, Texas.

Group *anthophoræ*.

75. \* **Mutilla concolor** Cresson (127).

California (M. C. Z.), Texas (Chicago Acad. Sci.).

Mr. Cockerell has sent a large series of what is apparently this species, collected at La Cueva, Organ Mountains (altitude 5500 ft.), September 4th; at Mesilla Park, June 8th; and at Arrego, near La Luz, August 23d, New Mexico. All the specimens were taken at light.

The shape of the petiole of the abdomen is subject to variation, but as the forms otherwise grade into each other, we can be certain that all belong to a single species. Some specimens have the petiole subnodose and punctate, as in the *imperialis* group, while others have the first and second segments of the abdomen nearly sessile, the first being almost impunctate.

76. **Mutilla hamata** sp. nov.

*Male*. Rufotestaceous. Head rounded behind, sparsely punctulate, mesonotum deeply and closely punctured, metanotum reticulate over all, mesosternum with two transverse obliquely pointed teeth, petiole impunctate, sessile with the impunctate second segment, two submarginals

Rufotestaceous; rather slender. Head broadly rounded and produced behind the eyes, nearly impunctate and very sparsely hairy; ocelli moderately large, the hind ones a little further from each other than from the eyes. Midway between the front ocellus and the base of the antennæ is a punctiform depression which extends forward to the base of the clypeus as a narrow groove ending in the transverse basal ridges of the clypeus; mandibles stout, blackened at the tips; antennæ concolorous with the body, short, the scape not paler, short and stout, punctured and provided with very short and sparse bristle-like hairs. Prothorax confluent rugosely punctate; mesonotum with close deep punctures, the grooves but slightly abbreviated in front; scutellum contiguously and deeply punctured; metathorax moderately reticulated over all; punctures of mesopleuræ becoming broader towards the coxæ; mesosternum with two strong

transverse triangular projections, the space between these and the middle coxæ roughened by small transverse ridges. Petiole of abdomen very finely and sparsely punctulate, broadly sessile with the second segment, its length about equalling its breadth, the front angles bluntly dentiform, the ventral surface provided with a A-shaped carina, which is emarginate before its anterior termination; remainder of abdomen impunctate; pygidium broad and rather blunt, very finely aciculate. Hairs of thorax and abdomen sparse, dusky; abdominal segments except the first provided with a thin fringe of white plumose hairs. Legs testaceous; hind femora, tarsi, and tibial spurs lightly infuscated. Wings hyaline, veins testaceous, stigma testaceous but a little darker than the veins, second submarginal cell receiving its recurrent vein before the middle, third submarginal wanting.

Length, 8 mm.

Fig. 60; front wing.

One male collected by Mr. C. H. T. Townsend at La Cueva, Organ Mountains, New Mexico. Altitude about 5300 feet. The insect was taken at light on the 9th of September. The species seems to come near *juxta* Blake.

Type in collection of the National Museum, Washington, D. C.

77. **Mutilla unicolor** Cresson (137).

A single specimen examined from the collection of the Museum of Comparative Zoology, collected in California, in August.

78. **Mutilla anthophoræ** Ashmead (138).

A female specimen of what seems to belong to this species was collected at Yuma, Arizona.

As Mr. Ashmead's description of this Californian species is not accessible in this city, the determination rests on Mr. Fox's analytical key.

79. **Mutilla tapajos** Blake (143).

Texas (M. C. Z.).

80. **Mutilla simpliciventris** sp. nov.

*Male.* Moderately robust, rufotestaceous; head broadly rounded, moderately punctured, hind ocelli spaced apart as far as they are from the eyes; prothorax and mesothorax coarsely punctured, the grooves abbreviated anteriorly, mesosternum with two crenulate ridges, metathorax strongly reticulate, the bisected anterior area as long as five of the meshes; petiole of abdomen triangular sessile, the punctures of the first and second segments strong, pygidium finely margined, last ventral with deep punctures; vestiture simple; wings subhyaline, veins and stigma testaceous, third submarginal nearly obliterated, second submarginal large.

Rufotestaceous, rather robust; head slightly produced behind the eyes, hind angles broad, hind margin truncate, punctures rather deep and close between the

eyes, becoming somewhat sparser on the occiput, hind ocelli but slightly further apart than their distance to the eyes, ocellar triangle blackish; clypeus with a pyramidal elevation on its posterior edge; mandibles very robust; antennæ as long as head and thorax, scape concolorous with the head, flagellum fuscous. Prothorax deeply and contiguously punctured, mesonotum subconfluently punctured, the punctures coarse and deep, shining, with four deep polished grooves abbreviated in front; metathorax strongly reticulate, the basal areas well bounded, elongate; pleuræ with finer punctures, the constrictions polished; mesosternum with small, close punctures, deeply impressed medially and on each side of this depression with a longitudinal row of seven denticles; vestiture of thorax very sparse. Petiole of abdomen but little longer than broad at tip and nearly sessile with the second segment, strongly convex, sparsely and rather strongly punctured, the punctures elongate anteriorly, ventrally with elongate pits; the low median carina only slightly crenulate; second segment as strongly punctured as the first, the punctures rather elongate; remaining segments minutely but not confluent punctulate on outer half; pygidium sharply margined; second segment of venter with stronger and closer punctures than the second dorsal, last ventral segment deeply and irregularly punctured; vestiture sparse, white, mostly erect, no apical fringes, hairs of last two segments yellow. Legs normal, slightly paler than the body, tibial spurs testaceous, hind ones one-half the length of the metatarsus, the sparse hairs white. Wings subhyaline, with a yellowish tinge, veins testaceous, stigma fusco-testaceous, second submarginal cell large, its outer border equal to its hind border, third submarginal nearly obsolete.

Length, 10 mm.

Fig. 56; mesosternum.

One male from the Peabody Collection of the Museum of Comparative Zoology, Cambridge, Mass. Captured in Texas, no definite locality given.

This species differs from *M. Wheeleri*, its nearest relative, by the square shape of the head, sparser and deeper punctures of the head, the unicolorous and more slender abdomen, which is covered with erect white vestiture, by the paler wings and deeper second submarginal cell.

#### 81. *Mutilla Wheeleri* sp. nov.

*Male.* Rufotestaceous; head rounded, irregularly punctured, the vertex confluent, hind ocelli nearer the eyes than each other; pro- and mesothorax deeply punctured, the grooves abbreviated anteriorly; metathorax moderately reticulate, the area as long as four areoles; mesosternum with a transversely rugose ridge on each side of the median line; petiole subsessile, the punctures coarse in front, posteriorly like those of the second segment, moderate; vestiture simple, abdomen castaneous apically; wings cinerascens, third submarginal weak, veins blackish, second submarginal elongate.

Rufotestaceous; the ocellar triangle and the tips of the mandibles black; a transverse, medially emarginate, subapical, suffused fascia of the second abdominal segment castaneous. Head rounded, moderately produced behind the eyes, not

truncate posteriorly, equalling in width the thorax, the vertex and front closely, the occiput sparsely, finely punctured, the punctures of the ocellar triangle transversely confluent; ocelli comparatively small, the front one flattened, distant its own width from the posterior ones which are separated slightly more than their distance from the eyes; clypeus raised at the middle of the base; mandibles pointed, densely pubescent, the basal production strong; antennæ defective. Pro- and mesothorax deeply punctured, the punctures subconfluent, especially on the dorsum where they become transversely so, mesonotum with four deeply impressed grooves abbreviated on their anterior third; scutellum rugoso-punctate, metathorax moderately reticulate, the basal areas long; the constrictions of the pleuræ slight, polished, remainder closely punctate; thorax elongate ovate, but little narrowed behind, prothorax with long, erect, whitish hairs, remaining hairs shorter and sparse; mesosternum nearly bare, closely punctured, deeply impressed medially, the impressiom bounded by a ( )-shaped ridge consisting of seven transverse teeth, the front one black and strongest. Petiole of abdomen somewhat longer than broad at tip, nearly sessile with the second segment, finely and sparsely punctured, the punctures elongate and coarser in front; second segment more densely punctured along the sides, sparsely and irregularly on the disc; the apical margin of the remaining segments fringed with whitish hairs; no erect hairs except on petiole; first ventral segment sharply carinate in front, second segment subconfluently punctured in front. Legs normal, without bristles, tibial spurs long, testaceous, the hind ones two-thirds the length of the metatarsi. Wings subhyaline, cinerascens apically, veins and stigma fuscous, second submarginal conspicuously longer than broad, its hind border longer than the second transverse cubital vein; third submarginal cell weak.

Length, 8 mm.

Described from one male, collected by the writer at Austin, Texas, May, 1901, and named in honor of William Morton Wheeler, my talented instructor, in memory of the many pleasant hours spent with him in the Texas-country. It differs from *hyalina* Blake by the coarser punctuation and different venation.

## 82. *Mutilla trita* sp. nov.

Small, pale, testaceous, thorax sparsely punctured, basal areas of metathorax moderate, mesosternum with two short teeth, petiole smooth, nearly sessile with the smooth second segment, hairs of body sparse, the abdominal fringes finely plumose, wings hyaline, veins pale yellow, third submarginal wanting.

*Male.* Small, rather slender, pale testaceous species. Head rounded, occipital angles not broad, little produced behind the eyes, ocellar triangle infuscated, the dark color diffused over the front; head very sparsely punctured; ocelli moderate, the hind ones slightly further from each other than from the eyes; the punctures of the front become deeper toward the antennæ, replacing the median groove; clypeus simple; tips of mandibles blackened, the basal tooth weak, obtuse; antennæ short, testaceous, scape paler, almost glabrous. Prothorax roughened but not punctured; mesonotum with moderate separated punctures and strongly abbreviated grooves; scutellum finely rugose; metanotum with coarse but shallow reticulation, the basal areas equalling three areoles; meso-

sternum roughened except medially and with two sharp but small dentiform projections rather near the hind portion. Petiole of abdomen as wide as long and twice as wide at tip as at base, its sides nearly straight, basal angles dentiform, above lightly convex, impunctate, not constricted behind, but nearly sessile with the impunctate second segment; remainder of abdomen impunctate but less shining; pygidium narrow, very finely aciculate. Legs short, slender, pale yellow, the joints and the tibial spurs testaceous. Wings hyaline, veins pale yellow, stigma brownish, third submarginal wanting, second receiving the recurrent nervure at its basal third.

Length, 6.25 mm.

Fig. 51; mesosternum.

One male. Las Cruces, New Mexico, Cockerell, No. 2335. Collected by Prof. E. O. Wooten. Type in National Museum.

83. **Mutilla pallida** Blake (145).

The indefinite locality Texas given at Cambridge.

84. \* **Mutilla alemon** Fox (147).

Three specimens from Texas, one from Austin, the others without definite locality label (M. C. Z.); and three from New Mexico (Saint Augustine, Las Cruces and Arrego; Cockerell), appear to belong to this species. The differences are of minor importance, but may be noted: legs sometimes false fuscous, the femora and tibiæ and the antennæ darker fuscous. The basal area of the metathorax is much shortened; the apical margins of the abdominal segments not distinctly fringed, the hair somewhat soiled.

85. **Mutilla acontius** Fox (148).

Four specimens, collected by Mr. Townsend, at light, in the Organ Mountains, New Mexico, about 5300 feet altitude, September 4th. These have comparatively long pubescence, and the reticulum of the metathorax is of large though shallow mesh. But two submarginal cells are present.

86. **Mutilla noctivaga** sp. nov.

*Male.* Robust, testaceo-rufous, completely clothed with fine, short, sparse, whitish hairs; head broad, sparsely punctured, humeri prominent, mesonotum closely and deeply punctured, mesosternum unarmed, metathorax reticulate, devoid of the two usual basal areas; first segment of abdomen very broadly sessile with the second, finely punctulate, second segment rather closely punctured; wings subhyaline, two submarginals.

Head considerably broader than long, broadly rounded and truncate behind, provided with fine scattered punctures, ocelli moderate, the hind ones as far from each other as from the eyes; a deep puncture but no furrow midway between the antennæ and the front ocellus; antennæ concolorous, the scape finely and densely punctulate; mandibles with tip blackened and with the basal tubercle

obsolete. Thorax broadly oval, pronotum finely rugosely punctured, subtransverse in front, the humeri broadly rounded; mesonotum closely and deeply punctured, the grooves vanishing on their forward fourth, scutellum coarsely metanotum rather finely reticulate over all; mesopleuræ contiguously punctured, mesosternum simple. Abdomen short, the first segment broader than long, very broadly sessile with the second, finely punctulate, second segment moderately punctured over all, remaining segments minutely closely punctulate and provided with rather denser simple hairs. Venter of abdomen punctured as above. Legs short, femora and tibiæ more or less castaneous, tibial spurs dull testaceous. Wings hyaline, veins testaceous, clearly cut, stigma castaneous, marginal cell short and broad, second submarginal short, receiving its recurrent nervure at the basal third, an extremely faint indication of a short third submarginal can be seen.

Length, 7 mm.

Fig. 46; occiput.

One male. Texas. The part of the State is not indicated. From the collection of the Museum of Comparative Zoology, Cambridge, Massachusetts.

This species is near *hyalina* Blake, but differs in the stronger punctuation of the abdomen and in the lack of the third submarginal cell.

#### Females.

The addition of a number of species makes the following modification of the table on page 261 of service. The edentate specimen of *simillima* has been included, as the previous tables would lead it to this place.

- Insect more or less clothed with appressed pubescence in addition to longer erect hairs.....2.
- Insect with no appressed pubescence, with erect hairs only.....6, etc.
2. First flagellar joint subequal to second and to scape.....2a.
- First flagellar joint longer than second or scape.....3.
- 2a. Second dorsal with appressed and erect pubescence.....2b.
- Second dorsal with erect hairs only.....**hypermnestra** Fox.
- 2b. Head and thorax rugosopunctate, the thorax coarser than the head; thorax rounded; abdomen not ornate.....2c.
- Head and thorax finely punctured, the thorax finer than the head; sides of metathorax sharp, thorax quadrate; second dorsal with two rounded patches of white hairs.....**aprica** sp. n.
- 2c. Mandibles short, bidentate at tip; pubescence long; pygidium less prominent; humeri dentate.....**venenaria** sp. n.
- Mandibles edentate but with a basal tubercle on outer side; pygidium distinctly margined.....2d.
- 2d. Pygidium with fine, deep, longitudinal striæ; pubescence short; apical half of abdomen blackish; humeri rounded.....**impar** sp. n.
- Pygidium faintly granular; insect ferruginous; pubescence moderately long; humeri dentate.....**pervaga** sp. n.

3. Pubescence scarlet, grading into fulvous in some specimens.

**anthophoræ** Ashm.

Pubescence pale golden in large part.....4.

4. Sides of thorax, abdomen and legs black; thorax somewhat elongate and pyriform; pubescence rather coarse; length, 12 mm..**auraria** Blake.

Greater part of body reddish; thorax shorter, more quadrate; pubescence silky; smaller species.....5.

5. Thorax anteriorly a little wider than the head, ground color fusco-ferruginous.

**aspasia** Blake.

Thorax narrower than the head.....5a.

- 5a. Abdomen with a basal triangular black spot and black apex, pubescence not glistening; legs black.....bidentate variety of **simillima** Smith.

Abdomen ferruginous, at most piceous apically, pubescence dense; legs at most fuscous.....**phædra** Blake.

87. **Mutilla venenaria** sp. nov.

*Female.* Testaceous rufous, pubescence long but not thick; mandibles bidentate at tip; eyes faceted; thorax quadrate, humeri dentiform, metathorax truncate; abdomen ovate, petiole sessile, second and third segments each with two ovate semitranslucent spots; pygidium rounded.

Head quadrate, rounded behind, not carinate, rugoso-punctate; eyes irregularly rounded, distinctly faceted; clypeus shallow, slightly convex; under side of head polished, impunctate; antennæ black, scape and pedicel reddish, scape stout, sparsely bristly, pedicel equal to the flagellar joints individually; mandibles short and robust, tipped with two stout black teeth; palpi piceous. Thorax subquadrate, sides rounded, truncate in front with humeri dentate, narrowed behind, metathorax obliquely truncate, rounded into the mesonotum; dorsal surface coarsely reticulate, becoming finely punctate in front of the abdomen; mesopleuræ reticulate, metapleuræ smooth. First segment of abdomen short, broadly sessile with the second, its punctuation fine above and below, not carinate ventrally; second dorsal with two large, approximated, oval, discal spots of varying testaceous color; third dorsal also with two rounded semitranslucent spots, more widely separated, and placed on the strigose anterior portion; on the area of separation is the well-marked quadrate speculum, which from its reflections gives to the segment the appearance of having a median light or dark fleck when the abdomen is drawn out; punctuation of abdomen close and fine, punctuation of the second segment dorsally and ventrally somewhat stronger and more separated; last dorsal segment convex, not margined, polished. Legs rufous, the front femora and tibiæ piceous, tarsi piceous apically, spines and spurs poorly developed, yellow. Vestiture of the body consists of sparse appressed hairs, black on the mesonotum and second dorsal segment, yellow and matted on the head, and of erect dusky hairs. The erect hairs of the head and mesonotum are short, of the pronotum, metathorax, petiole and apical and ventral segments of abdomen long and comparatively dense, though not thickly so; ventrally the hairs become whitish; apical margins of segments of abdomen finely fringed.

Length, 4-5 mm.

Fig. 35; petiole.

Four females. Fedor, Texas (Birkman). One dated April 29, 1898. Types in collections of Mr. Birkman and the writer.

Judged by its poorly defined pygidium, this species would be grouped with the species about *balteola*, but as it has no other relationship with these, and is obviously allied to the new forms here grouped about it, it is placed with them in the group *anthophoræ* of Mr. Fox.

88. **Mutilla impar** sp. nov.

*Female.* Ferruginous, closely punctured, nearly bare, apex of abdomen black, head rounded, eyes irregularly rounded, poorly faceted, polished, mandibles edentate, thorax elongate oval, raised posteriorly, metathorax rounded, first and second segments of abdomen broadly sessile, pygidium strongly striated, rufous.

Head ferruginous, round, not carinate, closely punctured, more sparsely and minutely beneath, pubescence sparse and short, yellowish; eyes irregularly rounded, convex, scarcely faceted, polished; clypeus entire; mandibles triangular in section, straight on outer part, pointed, thick basally due to a tubercular projection on outer side, tips blackened, mandibular hairs and mystax long but sparse, palpi pale yellow; scape about equalling the length of the mandible, rather thick, twisted, punctulate, nearly glabrous, pedicel slightly shorter than the nearly equal flagellar joints, the last joint one-half longer than the others. Thorax elongate ovate, equal in width to the head, its pubescence inconspicuous, concolorous, the punctuation stronger but not so close as on the head, humeri rounded, metathorax rugoso-punctate, the disc with longer erect yellow hairs, sides rounded. At the raised posterior part of the mesothorax the rugose punctures take on the character of scales in the largest specimen. Pleuræ punctured as on the dorsulum in front, posteriorly smooth and shining. Abdomen slender, finely punctured, petiole broadly contiguous with the second segment, ventral keel inconspicuous, pubescence of first segment erect, silvery, moderately dense, of second segment short, appressed, sparse, black except for two lateral spots of denser silvery hairs. In one of the smaller specimens the pubescence of this segment is denser and dusky, not black, and the lateral spots are wanting. Second, third, fourth and fifth segments fringed with whitish pubescence; first and second segments concolorous with the head and thorax, remainder of abdomen except the prominent rufous pygidium black, pygidium sharply margined and deeply longitudinally sulcate. Legs testaceous, the apices of the tibiæ piceous, posterior tibiæ fringed with yellow bristles and hairs, spurs not lengthened.

Length, 4-7 mm.

Fig. 36; petiole.

Two females, 4 and 7 mm., Fedor Tex., May, 1901 (Rev. G. Birkman).

*Var.*: tooth on outer side of mandible wanting, pygidium finely granular, second abdominal segment without the lateral patch of silvery pubescence, otherwise identical. Length, 4 mm.

One specimen, Fedor, Tex., April 28th (Rev. G. Birkman).

89. **Mutilla pervaga** sp. nov.

*Female.* Entirely rufous except the antennæ and posterior legs, which are tes-



taceous; head rounded, eyes faceted, mandibles short, strong and pointed, flagellar joints subequal; thorax quadrate, coarsely rugose; first abdominal segment sessile, pygidium granular; pubescence sparse, the erect white hairs moderately long.

Head rounded, closely punctured, pubescence very sparse, yellowish, eyes irregularly rounded, faceted and polished; mandibles short, stout at base, edentate, sharply pointed, tips black; scape short, nearly glabrous, pedicel but little shorter than the flagellar joints, which are all very nearly equal in length. Thorax quadrate, longer than wide, not constricted and but little narrowed posteriorly, front angles prominent, metathorax declivous but rounded into the mesonotum, its pubescence longer, dusky white; mesonotum coarsely rugoso-punctate becoming transversely rugose posteriorly; metanotum rugoso-punctate, smooth at apex; pleuræ highly polished and smooth on posterior half, anteriorly punctate; pubescence of thorax consisting of inconspicuous appressed whitish hairs and longer though not long white marginal pile. Abdomen rather closely and deeply punctate, the punctures of the second segment distinctly separated; vestiture whitish rather long at base and on apical segments; first ventral simply carinate; pygidium margined, finely granular. Posterior legs becoming testaceous apically; hairs of posterior tibiæ much finer than the spines, which themselves are only moderately developed; tibial spurs testaceous.

Length, 4.5 mm.

Fig. 37; petiole.

One female. Fedor, Texas (Rev. G. Birkman). No date.

This species resembles *venenaria*, but is readily distinguished by the form of the mandibles and of the pygidium.

#### 90. *Mutilla aprica* sp. nov.

*Female.* Testaceous, finely punctured species, clothed with sparse, appressed and erect pubescence, that of the second abdominal segment arranged in two silvery patches; head rounded, eyes oval, faceted, mandibles edentate, first flagellar joint but little longer than the second; thorax quadrate, metathorax abrupt, crenulate laterally; first and second abdominal segments broadly sessile, pygidium prominent.

Testaceous, head rounded, as wide as the thorax, rather closely and finely punctured, pubescence blackish and sparse, the erect hairs cropped, angles not carinate or dentate; clypeus shallowly convex, mystax long but scattered; eyes oval, rounded, faceted, dull; antennæ testaceous, scape short, punctured closely, hairs almost wanting, pedicel subequal to second flagellar joint, first joint slightly longer; mandibles slender, pointed, sickle-shaped, apical third black, along the sides are several prominent hairs. Thorax quadrate, flattened, but little constricted posteriorly, punctured like the head but more sparsely, pubescence silvery, short, more or less sparse and appressed, marginal hairs long, erect; metathorax abruptly declivous, smooth and polished except where it meets the mesonotum, where it is reticulate, as usual; pleuræ entirely smooth, polished. Abdomen elongate, minutely punctured, first and second segments sessile, the carina of the petiole slight, first and apical segments with long whitish hairs, pubescence of second segment black medially outlining two ovate patches of denser silvery pubescence, apical margin fringed with silvery, pubescence of

venter sparse; pygidium flattened broad at the tip, minutely granular. Legs testaceous, tibial spurs long, whitish, tibial spines yellow, poorly developed.

Length, 4 mm.

Fig. 38; petiole.

Three females. Fedor, Lee Co., Texas. May and October, 1899 (Birkman).

This species superficially resembles *scævolella* Ckll. and Casad., but is easily recognized by the sparse black hairs of the head.

91. \* **Mutilla phædra** Blake (154).

One specimen, from Marble Falls, Texas, November 11, 1899, differs in the erect hairs being white instead of golden.

Group *hexagona*.

92. **Mutilla hexagona** Say (161).

Wood's Hole, Mass.; Kansas (Westcott); Nebraska (M. C. Z.); Fedor, Texas (Birkman).

93. **Mutilla dubitata** Smith (162).

Wood's Hole, Mass.; Bath, Illinois, August; Virginia, Kansas (M. C. Z.); Columbus, Texas (Cockerell) = var. *dubitata*.

Fedor, Texas, April–October (Birkman); Idaho (M. C. Z.); Mesilla Park and Organ Mountains, New Mexico (Cockerell) = var. *ornativentris* Cresson (fig. 40; petiole).

This species is remarkably variable in color, size and structure. The sculpture of the pygidium is subject to variation. Normally the silvery markings of the second segment of the abdomen are linear; two females from Mesilla Park, N. M., and Santa Rosa, Mexico, have these spots ovate. Not rare.

94. **Mutilla nestor** Fox (163).

This species was common during June, 1900, at Galveston, Texas, flying over flowers like the males of the group *Sphærophthalma*. It occurs off the Coastal Plain at Fedor, Texas, also.

95. \* **Mutilla Grotei** Blake (164).

The Museum of Comparative Zoology contains this species from Texas.

96. **Mutilla promethea** Blake (165).

A single male was taken at Fedor, Texas, by Mr. Birkman.

97. \* **Mutilla Sayi** Blake, var. *hollensis*, var. nov.

Several males collected during different years at Wood's Hole, Mass., differ from the western form of *Sayi* in their coarser sculpture, although agreeing in color. They may be described as follows:

Head densely but finely punctured; antennæ black, the scape clothed with short blackish pile and with a rufous apex, third and fourth joints of antennæ equal. Mesothorax with five impressed smooth lines, the median one cuneiform and extending only a short distance in back of the collar, the intermediate pair entire, deep, the outer pair abbreviated anteriorly; scutellum reticulately punctured, the reticulation of nearly the same structure as the punctures at the hinder portion of the mesothorax; dorsal groove of the metathorax short, extending less than one-half the way to the middle; tegulæ impunctured, polished. First segment of abdomen black, closely punctured, its ventral keel acutely produced in front and angulate near the middle, second segment testaceous, finely and remotely punctured on the disc, laterally and apically the punctures become stronger and denser, and on the impressed apical margin become minute and dense, almost scabrous. The impressed margin and the remaining segments of the abdomen are darker ferruginous. Pubescence arising from the ferruginous chitin black, except that of the last two segments and the venter, which is whitish.

Specimens of *Sayi* from Nebraska are in the collection of the Museum of Comparative Zoology. A light-colored specimen was found flying in a gravel-pit in Lake County, Ill., September. *Cariniceps vesta*, *ferrugata* and *sparsa* were the only females discovered in the vicinity after diligent search. Can this be the male of one of these?

Group *scrupea*.98. **Mutilla scrupea** Say (171).

Texas (Museum of Comparative Zoology).

99. **Mutilla copano** Blake (172).

Texas (M. C. Z.)

100. **Mutilla susura** sp. nov.

*Male.* Robust, coarsely punctured, head and thorax black, with short griseous pubescence, abdomen rufous, eyes deeply emarginate, petiole of abdomen short, constricted, black, legs and antennæ black.

Head small, narrower than the thorax, coarsely, confluent and rugosely punctured, clothed with sparse, irregular, short, whitish hairs, ocelli small, eyes large, strongly emarginate in front; antennæ short, stout, black, the scape nearly impunctate; mandibles but little reddish apically, short and stout, a prominent tubercle at their base. Thorax robust, wide at the tegulæ, narrowed before and behind, the sides of the anterior portion not curved, humeri dentiform, the front edge of the large prothorax broadly and shallowly excavated; prothorax and mesothorax and scutellum very coarsely, deeply, rugosely punctured, metanotum

coarsely reticulated, its shallowly pitted posterior face abruptly declivous; tegulae very large, scoop-shaped, punctulate, black, and slightly hairy; mesopleurae coarsely punctured, with almost sericeous pubescence. Petiole of abdomen short, transverse, black, its forward portion abrupt, shallowly excavated, glabrous and polished, its posterior part more or less cylindrical, strongly punctured and covered with sericeous yellowish pubescence, ventrally the petiole bears a prominent carina terminating anteriorly as a strong tooth; second segment uniformly but strongly punctured, its hairs dusky, becoming yellowish, short and sparse, fringed apically with deep honey-yellow short hairs; remaining segments more finely punctate, the discal hairs longer and deeper yellow, not fringed; ventral segments sculptured as above, their hairs whitish; pygidium unmarginated, but with a strong median keel extending over two-thirds its length, apical hooks ferruginous. Legs short, slender, black, their pubescence and tibial spurs griseous. Wings short, not extending beyond the third abdominal segment, fuliginous, the base somewhat paler, provided with hyaline markings as follows: one transverse streak in the first submarginal cell, one oblique in the second, two dots in the obsolete third, and one longitudinal streak in the obsolete outer discoidal; veins narrow, black, stigma minute.

Length, 7 mm.

One specimen, collected by the writer at Galveston, Texas, June 7, 1900.

This species is a near relative of *copano* Blake, differing mainly in the coarser sculpture of the second abdominal segment.

101. **Mutilla puteola** Blake (174).

Fig. 41; petiolo.

Several females from Fedor, Texas (Birkman), May 13-17, 1899. All measure 3.5 mm.

102. **Mutilla sudatrix** sp. nov.

*Female.* Head thickly covered with short appressed golden pubescence, second abdominal segment with two discal spots of whitish pubescence, its apical margin with a clear-cut white band interrupted at the middle, punctures deep.

*Castaneous.* Head rounded, lighter in color than the body, almost ferruginous, the vertex equalling the width of the thorax, occiput hemispherical, closely and rather deeply punctured, but the sculpture concealed beneath the dense, matted, golden pubescence which covers the whole upper surface and extends more sparsely on the sides; eyes large, elongate-ovate, the ommatidia distinct; clypeus slightly emarginate in the middle; cheeks with an obtuse tooth within; antennae entirely ferruginous, scape short, slightly curved towards tip, in length two-thirds the width of the front, punctulate, covered with sparse yellowish hairs, basal joints of flagellum subequal in length. Mesothorax nearly uniformly rounded, slightly more declivous in front, closely, deeply and regularly punctate, provided with sparse, scattered, decumbent, yellowish pubescence and a few erect, dusky hairs; seen from above, the humeri, propleurae and metapleurae are sericeous; no scutellar scale. Petiole short, transverse, quadrate, impunctate except for a single transverse central series of deep setigerous punctures, no

ventral carina developed, clothed above with a mat of silvery pubescence; second abdominal segment closely, deeply and uniformly punctured, the punctures slightly deeper than those of the thorax. In *puteola* the punctures are relatively more distant and less deep. On each side of the middle of the basal third of this segment is an elliptical sericeous spot; the hind margin for a distance of one-sixth the segment closely fringed with sericeous white pubescence which extends forward along the lateral margins; elsewhere the appressed pubescence of this segment is black and sparser, becoming dirty yellow on the anterior portion; the scattered erect hairs conform in color with the appressed pubescence out of which they arise; remaining segments with dusky hairs, the punctuation minute; no pygidium. Legs ferruginous, their bristles and hairs concolorous.

Length, 5.5 mm.

One specimen, collected by the Rev. G. Birkman at Fedor, Texas, May 16, 1899.

This species is closely related to *puteola* Bl., differing by its larger size, stronger punctuation and more ornate marking.

## THINNINÆ.

Genus **CHYPHOTES** Blake.

### 103. **Chyphotes Belfragei** Blake (5).

Fedor and Austin, Texas, and one large specimen from Mesilla Park, New Mexico. Not rare. We have taken this in spider-nests on window-sills, where they have become entangled during the night while seeking to approach the light.

### 104. **Chyphotes attenuatus** Blake (8).

Mesilla Park and Santa Fé New Mexico. Also found at light at Arrego, New Mexico. Not rare. This belongs to the recently erected genus *Typhoctes* Ashmead. The fore wing is represented in fig. 63.

### 105. **Chyphotes Heathii** sp. nov.

*Male.* Very slender, pale castaneous, legs concolorous, metathorax with fine papillæ at the junctures of the usual reticulum which is absent, wings clouded beyond the cells, stigma large, saturate, three submarginals, the outermost quadrate.

Whole insect castaneous except the black ocelli and eyes and the fuscous flagellum. Head ovate, much produced behind, very sparsely punctulate, mandibles brownish at tip; eyes large, round, subemarginate behind, the facets minute but distinct; scape yellow, shorter than a flagellar joint, the pedicel yellow, one-third the length of the next joint, antennæ as long as the head and thorax. Prothorax finely but unevenly punctured, mesothorax shining, finely punctate, with two lateral grooves; scutellum impunctate except for a marginal row of setigerous punctures; metathorax irregularly roughened, provided with fine tubercles which appear to mark the junctures of the absent reticulum, posteriorly the

network is faintly indicated, pleuræ shining more or less, punctured. Petiole occupying more than one-third the length of the whole abdomen, coarsely punctured above, rugose beneath, much swollen on outer half and constricted at tip, second segment with finer punctures, remainder impunctate. Legs slender, posterior femora subfuscous, tibial spurs reddish. Wings hyaline basally, suddenly infumated beyond the marginal cell, veins fuscous, stigma broad, longer than the marginal cell, fuscous, marginal cell narrow, round apically, three sub-marginals, the second broad at the top, the third quadrate, but both its transverse veins sinuous.

Length, 9.75 mm.

Fig. 61; fore wing.

One male, collected by Dr. Harold Heath, May, 1901, at Pacific Grove, Cal., to whom the species is respectfully dedicated. Type in writer's collection.

106. \***Chyphotes nubeculus** Cresson (10).

Seven specimens, from Denver, Colorado; Las Cruces, San Marcial, Santa Fé, and Arrego, New Mexico (Cockerell).

Taken at light.

107. **Chyphotes peculiaris** Cresson (11).

This brilliant insect was received from Professor Cockerell from the College campus at Mesilla Park, New Mexico. September.

Dr. Ashmead has made this species the type of his genus *Typhoctes*.

Genus **BRACHYCISTIS** Fox.

108. **Brachycistis idotes** Cockerell (2).

Fig. 62; wing.

Las Cruces, New Mexico, one specimen.

109. **Brachycistis elegantulus** Cockerell and Casad. (9).

Arrego, ten miles west of La Luz, not far east from Tallarosa Road, New Mexico, August 23d, at light. It may be here mentioned that all references to Arrego in this paper indicate this place and date. The insects were collected by Mr. C. H. Townsend and contributed by Mr. Cockerell.

110. **Brachycistis inæqualis** Fox (10).

Two specimens, sent by Professor Cockerell as collected at Saint Augustine, New Mexico, differ slightly among themselves and from the description of *inæqualis*. Although these differences may appear striking, it seems well not to regard them as belonging to different species, in view of their otherwise similar structure, size, and con-

tour of body. Moreover, as they were taken together, the differences in this case do not seem to be of specific value. Briefly, the points of difference between the two individuals may be stated thus:

*a.* Head brown; ocelli large, the distance between the eye and hind ones less than the diameter of an ocellus; stigma fuscous, marginal cell projecting beyond the stigma by nearly the width of the latter.

*b.* Head concolorous; ocelli small, the distance between the eye and the hind ones considerably greater than the diameter of ocellus; stigma black, marginal cell projecting from it by less than one half the width of the stigma.

These specimens differ from the description of *inaequalis* as follows: antennæ not darker; marginal cell longer, second submarginal longer than the third, third submarginal subquadrate, but higher than long.

The petiole of the abdomen is highest just behind the middle, and then is flattened to the tip, which seems to be different from the conformation in *inaequalis*. Until the specimens are compared with the types of Mr. Fox's species it would be unwise to found another species on them.

111. **Brachycistis glabrella** Cresson (12).

Twenty-two specimens, variable in the length and shape of the petiole of the abdomen. Albuquerque, Silver City, Arrego, and Organ Mountains, New Mexico, taken at light (Cockerell); New Mexico, Texas (M. C. Z.).

112. \* **Brachycistis castaneus** Cresson (14).

"Texas" (Chicago Acad. Sci.); Mesilla Park, La Cueva, Silver City, Deming, Arrego, New Mexico (Cockerell). At light. Numerous specimens.

113. \* **Brachycistis indiscretus** Fox (16).

Eight specimens, taken at light at Mesilla Park, May (Cockerell), appear to belong here. The variability lies in the sculpture of the mesonotum, which is generally very finely granular and with a broad, shallow dorsal groove, and in the neuration of the wings. The third submarginal is inconstant as to form, ranging from a nearly closed circle to a subquadrate cell larger than the second submarginal.

114. **Brachycistis cremastogaster** sp. nov.

*Male.* Head castaneus; thorax, abdomen, legs and antennæ pale rufous, pubescence rather sparse, dusky; ocelli large, the hind ones nearer the eyes than their diameter, the distance between them twice their diameter, their hind edges connected by a deeply impressed line; clypeus slightly and broadly produced at the middle; antennal scape subequal to length of flagellar joints, punctures of head sparse and fine, occiput but little produced and truncate. Mesonotum and scutellum with fine scattered punctures, mesosternal punctures slightly stronger, mesopleural punctures close; metathorax smooth above, very slightly roughened, almost smooth, posteriorly. Petiole of abdomen campanulate, strongly nodose, depressed above, constricted from the second segment, but little longer than its greatest breadth, impunctate except for a set of close punctures posteriorly on the sides, ventral segments somewhat darker. Femora rufo-castaneous, tibiæ and tarsi more or less pale. Wings clear hyaline, veins testaceous, stigma fuscous, marginal cell somewhat more than two-thirds the length of the stigma, second submarginal triangular, its sides ending near the base of the marginal, its length on the cubital less than the length of the trapezoidal third cell, third submarginal longer than high.

Length, 10 mm.

Two specimens, indefinitely labelled "Texas," from the Andrew Bolter collection in the Chicago Academy of Science.

This species will lead to *triangularis* Fox in Mr. Fox's table, but it differs from the description of that species thus: pubescence sparse, almost wanting; metathorax nearly smooth; petiole impunctate except posteriorly on the sides, where it is finely punctured; third submarginal longer than high and longer than the second. The head is darker, and the size much larger.

115. **Brachycistis Gaudii** Cockerell.

Fig. 64; fore wing.

One specimen, La Jolla, California.

Genus **MYRMOSA** Latreille.

116. **Myrmosa unicolor** Say (1 and 4).

*Myrmosa unicolor* Say. ♂.

*Myrmosa thoracica* Blake. ♀.

The males and females occur in the same fields at Wood's Hole, Mass., the males frequently hovering over the flowers, the females running about on ground riddled by the nests of *Halictus*. The females were common throughout the present summer in a gravel-pit in Lake County, Ill. The ground here was riddled with nests of *Halictus* spp. and various wasps. See fig. 66 for venation.

Genus **METHOCA** Latreille.

117. **Methoca stygia** Say (1).

Fig. 65; wing.

Not rare on Umbelliferous flowers at Wood's Hole, Mass.



118. **Methoca bicolor** Fabr. (3).

A single specimen in a gravel-pit, Lake County, Ill. August.

119. \* **Methoca californica** Westwood (4).

Several specimens, from Fedor, Texas (Birkman), agree with Westwood's description. Another specimen, from Pistakee Lake, Ill., is exactly similar. September.

While the press-work was being done, two species were obtained in a gravel quarry in Northern Illinois which are not here noticed. These are *cariniceps* Fox and *sparsa* Fox, and both have their distribution materially extended by this discovery. This makes a list of one hundred and twenty-one species studied.

## EXPLANATION OF PLATE IV.

- |   |  |
|---|--|
| Fig. 1. Profile of first ventral abdominal segment of <i>simillima</i> , ♀. | Fig. 34. " <i>Birkmani</i> , ♀.                            |
| Fig. 2. Same of <i>brazoria</i> , ♀.  | " 35. " <i>venenaria</i> , ♀.                              |
| " 3. " <i>waco</i> , ♀.   | " 36. " <i>impar</i> , type, ♀.                            |
| " 4. " <i>harmonia</i> , ♀.   | " 37. " <i>pervaga</i> , ♀.                                |
| " 5. " <i>gloriosa</i> , ♀.   | " 38. " <i>aprica</i> , ♀.                                 |
| " 6. " <i>pseudopappus</i> , ♀.   | " 39. " <i>dubitata</i> , ♀.                               |
| " 7. " <i>magna</i> , ♀.  | " 40. " <i>ornativentris</i> , ♀.                          |
| " 8. " <i>erudita</i> , ♀.  | " 41. " <i>puteola</i> , ♀.                                |
| " 9. " <i>occidentalis</i> , ♀.   | " 42. Pygidium of <i>hippodamia</i> , ♀.                   |
| " 10. " <i>comanche</i> , ♀.  | " 43. " " <i>chlamydata</i> , ♀.                           |
| " 11. " <i>orcus</i> , ♀.   | " 44. " " <i>pseudopappus</i> , ♀.                         |
| " 12. " <i>medea</i> , ♀.   | " 45. " " <i>gloriosa</i> , ♀.                             |
| " 13. " <i>ægina</i> , ♀.   | " 46. Head of <i>noctivaga</i> , ♂.                        |
| " 14. " <i>electra</i> , ♀.   | " 47. Head of <i>hebes</i> , ♂.                            |
| " 15. " <i>ferrugata</i> , ♀.   | " 48. Head of <i>erebus</i> , ♂.                           |
| " 16. " <i>vesta</i> , ♀.   | " 49. Profile of mesosternum of <i>hastata</i> , ♂.        |
| " 17. " <i>vesta</i> , var. <i>b</i> , ♀.                                   | " 50. Same of <i>erebus</i> . [mata, ♂.                    |
| " 18. " <i>vesta</i> , var. <i>c</i> , ♀.                                   | " 51. " <i>trita</i> .                                     |
| " 19. " <i>cypripis</i> , ♀.  | " 52. " <i>hebes</i> .                                     |
| " 20. " <i>infensa</i> , ♀.   | " 53. " <i>pudica</i> .                                    |
| " 21. " <i>chlamydata</i> , ♀.  | " 54. " <i>danagus</i> .                                   |
| " 22. " <i>texana</i> , ♀.  | " 55. " <i>Cockerelli</i> .                                |
| " 23. " <i>pæcilonota</i> , ♀.  | " 56. " <i>simpliciventris</i> .                           |
| " 24. " <i>Bollii</i> , ♀.  | " 57. Hair from abdominal fringe of <i>Westcottii</i> , ♂. |
| " 25. " <i>zelaya</i> , ♀.  | " 58. Wing of <i>Mutilla grata</i> , ♂.                    |
| " 26. " <i>obscura</i> , ♂.   | " 59. " " <i>bellerophon</i> .                             |
| " 27. " <i>californica</i> , ♀.   | " 60. " " <i>hamata</i> .                                  |
| " 28. " <i>Foxii</i> , ♂.   | " 61. " <i>Chyphotes</i> <i>Heathii</i> .                  |
| " 29. " <i>Foxii</i> , ♀.   | " 62. " <i>Brachycistis</i> <i>idotes</i> .                |
| " 30. " <i>tisiphone</i> , ♀.   | " 63. " <i>Typhoctes</i> <i>attenuatus</i> .               |
| " 31. " <i>fulvohirta</i> , ♂.  | " 64. " <i>Brachycistis</i> <i>Gaudii</i> .                |
| " 32. " <i>balteola</i> , ♀.  | " 65. " <i>Methoca</i> <i>stygia</i> .                     |
| " 33. " <i>pudica</i> , ♂.  | " 66. " <i>Myrmosa</i> <i>unicolor</i> .                   |

